WHAT IS CLAIMED IS:

1. A current-perpendicular-to-plane (CPP) GMR/tunnel valve (TV) sensor, comprising:

a sensor stack having a free layer forming an active area;

a spacer layer formed over the free layer of the sensor stack;

a biasing layer disposed over the spacer; and

a high coercivity layer formed adjacent the sensor stack for pinning the biasing layer, the biasing layer maintaining a direction of magnetization in the free layer until influenced by a readback field.

2. The CPP GMR/ TV sensor of claim 1, wherein the high coercivity layer comprises an alpha-Fe_2O_3 layer.

3. The CPP GMR/ TV sensor of claim 1 further comprising a seed layer disposed over the high coercivity layer and a coupling layer disposed over the bias layer and the seed layer.

4. The CPP GMR/ TV sensor of claim 3, wherein the seed layer comprises a NiFe seed layer, the high coercivity layer comprises an alpha-Fe_2O_3 layer formed adjacent the sensor stack in a passive area and the coupling layer comprises NiFe layer.

5. The CPP GMR/ TV sensor of claim 1, wherein the sensor stack comprises a pinned layer, a spacer layer and the free layer.

6. The CPP GMR/ TV sensor of claim 5, wherein the pinned layer comprises a first CoFe layer, a Ru layer and a second CoFe layer.

7. The CPP GMR/ TV sensor of claim 5, wherein the free layer comprises a CoFe/NiFe alloy layer.

8. The CPP GMR/ TV sensor of claim 5, wherein the sensor stack further comprises a sensor stack seed layer, the pinned layer being formed on the seed layer.

9. The CPP GMR/ TV sensor of claim 8, wherein the sensor stack seed layer comprises a NiFeCr layer, a NiFe layer and a PtMn layer.

10. The CPP GMR/ TV sensor of claim 1, wherein the bias layer attains pinning by exchange coupling between the bias layer in the active area and passive areas.

11. A magnetic storage system, comprising:

a magnetic storage medium having a plurality of tracks for recording of data; and

a CPP GMR/ TV sensor maintained in a closely spaced position relative to the magnetic storage medium during relative motion between the magnetic transducer and the magnetic storage medium, the CPP GMR/ TV sensor further comprising:

a sensor stack having a free layer forming an active area;

a spacer layer formed over the free layer of the sensor stack;

a biasing layer disposed over the spacer; and

a high coercivity layer formed adjacent the sensor stack for pinning the biasing layer, the biasing layer maintaining a direction of magnetization in the free layer until influenced by a readback field.

12. The CPP GMR/ TV sensor of claim 11, wherein the high coercivity layer comprises an alpha-Fe_2O_3 layer.

13. The CPP GMR/ TV sensor of claim 11 further comprising a seed layer disposed over the high coercivity layer and a coupling layer disposed over the bias layer and the seed layer.

14. The CPP GMR/ TV sensor of claim 13, wherein the seed layer comprises a NiFe seed layer, the high coercivity layer comprises an alpha-Fe_2O_3 layer formed adjacent the sensor stack in a passive area and the coupling layer comprises NiFe layer.

15. The CPP GMR/ TV sensor of claim 11, wherein the sensor stack comprises a pinned layer, a spacer layer and the free layer.

16. The CPP GMR/ TV sensor of claim 15, wherein the pinned layer comprises a first CoFe layer, a Ru layer and a second CoFe layer.

17. The CPP GMR/ TV sensor of claim 15, wherein the free layer comprises a CoFe/NiFe alloy layer.

18. The CPP GMR/ TV sensor of claim 15, wherein the sensor stack further comprises a sensor stack seed layer, the pinned layer being formed on the seed layer.

19. The CPP GMR/ TV sensor of claim 18, wherein the sensor stack seed layer comprises a NiFeCr layer, a NiFe layer and a PtMn layer.

20. The CPP GMR/ TV sensor of claim 11, wherein the bias layer attains pinning by exchange coupling between the bias layer in the active area and passive areas.

21. A method for reducing the thickness of a sensor stack in a current-perpendicular-to-plane (CPP) GMR/tunnel valve (TV) sensor, comprising:

forming a sensor stack seed layer;

forming, over the sensor stack seed layer, a sensor stack having a free layer, a spacer and a pinned layer;

forming a spacer over the free layer of the sensor stack;

forming a bias layer over the spacer;

adjacent to the sensor stack, forming a high coercivity layer for pinning the bias layer;

forming a passive area seed layer over the high coercivity layer;

forming a layer of Ta over the bias layer and the passive area seed layer;

removing the Ta layer even with the bias layer;

forming, over the bias layer and the passive area seed layer, a coupling layer for pinning the biasing layer, the biasing layer maintaining a direction of magnetization in the free layer until influenced by a readback field; and

forming a cap over the coupling layer.